

**Nutr 245: Medical Nutrition Therapy: A Case Study Approach 3<sup>rd</sup> ed.**  
**Case 6 – Hypertension and Cardiovascular Disease**

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**Instructions: This is not a group case study; it is an individual assignment! Complete the following questions using the background information of Case 6 (pages 63-69). Use this as a template and type in your answers.**

**Remember RD's are experts in researching evidence-based practice for their patients so you can use other *credible* sources. \*\*\*Be sure to reference your answers and provide a Work Cited page at the end.\*\*\***

**I. Understanding the Disease and Pathophysiology**

1. *Dr. Thornton indicated in his admitting note that he will “rule out metabolic syndrome.” What is metabolic syndrome?*

Metabolic syndrome is the name for a combination of risk factors that occur together and increase the risk for coronary artery disease, stroke, and type 2 diabetes. It is not been determined if this syndrome is due to one single cause, but all of the risk factors are related to obesity. These risk factors include having apple shaped fat distribution, insulin resistance, aging, genetics, hormone changes, and lack of exercise. (1)

2. *What factors found in the medical and social history are pertinent for determining Mrs. Anderson's CHD risk category?*

| Medical history  | Social history   |
|--|--|
| • stage 2 HTN<br>High LDL, low HDL cholesterol<br>Family History (Mother died of high blood pressure, had heart attack and heart problems) | •History of smoking, secondhand smoke<br>African American ethnicity<br>Athrogenic diet<br>Female approaching age 55 post menopause |

**II. Understanding the Nutrition Therapy**

3. *What are the most recent recommendations for nutrition therapy in hypertension? Explain the history of and rationale for the DASH diet.*

The most recent recommendations for nutrition therapy in hypertension call for weight reduction, limiting sodium to less than 2300mg per day, limiting alcohol intake to no more than 2 drinks per day for men and 1 per day for women, increasing intake of calcium, potassium, and magnesium, physical activity of at least 30 minutes per day, and smoking cessation.

The DASH diet approaches nutrition therapy for hypertension with a comprehensive method. The DASH diet was formed as a result of two studies performed by a number of prominent scientists in the 1990s supported by the National Heart, Lung, and Blood Institute. The first study was called “DASH” and tested the effects of nutrients in food on blood pressure. It found that blood pressure was brought down when the diet was low in saturated fat, cholesterol, and total fat, and emphasized 8-9 servings of fruits and vegetables, and three servings of low fat dairy. The DASH eating plan also includes whole grains, fish, poultry, and nuts, and is low in red meat, sweets, and sugar containing beverages. It is full of magnesium, potassium, calcium, protein, and fiber. In the study three different diets were compared: a typical American diet, a typical American diet with additional fruits and vegetables, and the DASH eating plan. The DASH eating plan had the greatest effect, especially on those of the 459 adult study participants that had high blood pressure. There was a great and fast effect on the reduction of blood pressure. In the second study, called “DASH Sodium,” participants followed either the DASH eating plan or the typical American diet. Participants were assigned one of the diets and each month one

of three sodium levels were incorporated into the diet (3300 mg, 2400 mg, or 1500 mg per day). Results found that the DASH eating plan reduced blood pressure better than the typical American diet at any sodium level, but the greatest reduction was with the lowest amount of sodium in the diet. (4) (pg 293-297)

4. ***What are the Therapeutic Lifestyle Changes? Outline the components of the nutrition therapy interventions.***

The Therapeutic Lifestyle Changes (TLC) diet is helpful in lowering LDL cholesterol. The composition of the TLC diet calls for saturated fat to be less than 7% of total calories (less from trans fat), polyunsaturated fat up to 10% of total calories, monounsaturated fat up to 20% of total calories, total fat 25-35% of total calories, carbohydrate 50-60% of total calories (emphasis on complex carbs), 20-30 grams of fiber per day, protein approximately 15% of total calories, less than 200mg/day of cholesterol. Energy intake and output should be balanced in order to maintain healthy body weight and prevent weight gain. (2)

5. ***What is the rationale for the use of plant stanols/sterols and list some products that you may recommend?***

Plant stanols/sterols reduce the absorption of cholesterol by up to 65%. This can lower your LDL-c by 9-20%. (2) Plant stanols/sterols can be found in fortified margarines (such as Smart Balance Omega Plus Buttery Spread), salad dressings, and now even breads, cereals, and yogurts. These can easily be added to a patient's daily diet. (5)

### III. Nutrition Assessment

#### A. Evaluation of Weight/Body Composition

6. ***Calculate Mrs. Anderson's body mass index (BMI). What are the health implications of this number?***

$$(160/(66*66))*703=25.822$$

Her BMI is 28.8 which indicates that she is overweight, which puts her at an increased risk for many health problems such as cardiovascular disease, hypertension, and diabetes.(4)

#### B. Calculation of Nutrient Requirements

7. ***Calculate Mrs. Anderson's resting and total energy needs. Identify the formula/calculation method you used and explain your rationale for using it. (HINT: which formula is the most accurate?)***

I used the Mifflin-St. Jeor equation to find Mrs. Anderson's energy needs because it has been proven to be the most accurate.

$$REE=10W+6.25H-5Age-161$$

$$10(72.57kg)+6.25(167.64cm)-5(54 \text{ years})-161=1342.5$$

Activity factor of 1.3 because she is out of bed

$$1342.5 \times 1.3=1745.3 \text{ kcal total energy needs}$$

(4) page 60

#### C. Intake Domain

8. ***Using a computer dietary analysis program or food composition table, compare Mrs. Anderson's "usual" dietary intake to her prescribed diet (DASH/TLC diet).***

| NUTRIENT   | PATIENT INTAKE | Prescribed diet | DISEASE IMPLICATIONS based on diet comparison | Your diet recommendations  |
|------------|----------------|-----------------|---|--|
| kcal       | 3866.77        | 1745.3          | Overweight, risk for many diseases            | Limit kcal, replace high calorie foods with more energy dense foods, decrease sweets |
| % kcal Pro | 10.6           | 10-20%          | Adequate                                      |  |
| % kcal CHO | 42.55          | 50-60%          | low   | Increase consumption of  |

|             |          |                 |  |   |
|-------------|----------|-----------------|--|---|
|             |          |                 |  | good carbohydrates such as whole grains and fruits and vegetables                                     |
| % kcal Fat  | 41.75    | 25-30%          | Excess fat, risk for cardiovascular disease, weight gain | Decrease consumption of high fat foods, use less butter, choose healthier salad dressings             |
| %SFA        | 16.25    | Less than 7     | Causes high cholesterol, CVD                             | Use less butter, healthier salad dressings, switch to oil based dressings, cut out high fat ice cream |
| %MUFA       | 1.58     | Up to 20        | Low levels affect heart health negatively                | Switch to oil based dressings as opposed to creamy ones, use less butter                              |
| %PUFA       | 1.27     | Up to 10        | Low levels affect heart health negatively                | Switch to oil based dressings as opposed to creamy ones, use less butter                              |
| Cholesterol | 632.56mg | Less than 200mg | Extremely high, CVD                                      | Switch to more plant based proteins   |
| Fiber       | 28.95g   | 20-30 g         | adequate   |   |
| Na          | 5504.8mg | Under 2300mg    | Extremely high, cause of hypertension                    | Stop adding salt to food, find other ways to flavor foods   |
| Ca          | 1159.9mg | 1000 mg         | adequate   |   |
| K           | 3065.2mg | 4700mg/day      | Low, by increasing, can improve heart health             | Eat more bananas, oranges, etc v  |

**9. From the information gathered within the intake domain, list possible nutrition problems using the diagnostic term.**

Energy Balance: Excessive energy intake

Oral of Nutrition Support Intake: Excessive oral intake

Nutrient: Excessive Fat intake, less than optimal intakes of types of fats (saturated, monounsaturated, polyunsaturated), inadequate carbohydrate intake, excessive sodium intake

**D. Clinical Domain**

**10. Dr. Thornton ordered the following labs: fasting glucose, cholesterol, triglycerides, and creatinine. He also ordered an EKG. In the following table, outline the indication for these tests (tests provide information related to a disease or condition).**

| <i>Parameter</i>  | <i>Normal Value</i> | <i>Patient's Value</i> | <i>Reason for Abnormality</i> | <i>Your diet recommendations based on results</i>   |
|-------------------|---------------------|------------------------|-------------------------------|---|
| <i>Glucose</i>    | <i>70-110</i>       | 92                     | No abnormality                | Keep sugar intake under control to prevent diabetes |
| <i>BUN</i>        | <i>8-18</i>         | 20                     | Excessive protein breakdown   | Increase protein in diet                            |
| <i>Creatinine</i> | <i>0.6-1.2</i>      | 0.9                    | No abnormality                | Choose complete protein sources                     |

| <i>Parameter</i>         | <i>Normal Value</i> | <i>Patient's Value</i> | <i>Reason for Abnormality</i>   | <i>Your diet recommendations based on results</i>                                |
|--------------------------|---------------------|------------------------|---------------------------------|--|
| <i>Total cholesterol</i> | <i>120-199</i>      | 270                    | High LDL cholesterol            | Choose foods with less saturated fat, increase exercise                          |
| <i>HDL-cholesterol</i>   | <i>&gt;55</i>       | 30                     | Low HDL in diet                 | Choose foods that will raise HDL, increase exercise                              |
| <i>LDL-cholesterol</i>   | <i>&lt;130</i>      | 210                    | High LDL in diet                | Choose foods that will lower LDL (those with less saturated fat)                 |
| <i>Apo A</i>             | <i>101-199</i>      | 75                     | diuretics                       | Regular exercise, decreasing saturated fat in diet                               |
| <i>Apo B</i>             | <i>60-126</i>       | 140                    | Diuretics                       | Proper diet and exercise to lower LDL levels and decrease risk for heart disease |
| <i>Triglycerides</i>     | <i>35-135</i>       | 150                    | Physical inactivity, overweight | Work on eating healthier and exercising more to get weight into a healthy range  |

(3)

11. Indicate the pharmacological differences among the antihypertensive agents listed below.

| <i>Medications</i>                      | <i>Mechanism of Action</i>   | <i>Potential food-drug interactions</i>  |
|---|--|--|
| <i>Diuretics</i>                        | Increase urination, help to remove water, sodium, and choride from the body  | Some cause loss of potassium, calcium and magnesium from the body, supplements may be needed. Low sodium is recommended      |
| <i>Beta-blockers</i>                    | Slow heart rate and relax blood vessels so heart does not have to work so hard. Treat high blood pressure and heart attacks and prevent angina | Need to take with food so your blood pressure will not drop too low  |
| <i>Calcium-channel blockers</i>         | Lower blood pressure   | Low sodium diet recommended, avoid licorice and grapefruit, calcium and vit D supplement may decrease the effect of the drug |
| <i>ACE inhibitors</i>                   | Relax blood vessels so heart pumps more smoothly   | Can increase potassium in body, avoid foods high in potassium, avoid licorice, low sodium is recommended                     |
| <i>Angiotensin II receptor blockers</i> | Widens blood vessels to increase amount of blood being pumped  | Choose low sodium and low potassium foods  |
| <i>Alpha-adrenergic blockers</i>        | Keep blood vessels open and relaxed by keeping norepinephrine from tightening the muscles  | Avoid licorice   |

(6)

12. What are the most common nutritional implications of taking hydrochlorothiazide?

Hydrochlorothiazide is a diuretic which can inhibit the reabsorption of sodium, chloride and potassium. This may negatively affect the electrolyte balance of the person taking it.

**13. Mrs. Anderson's physician has decided to prescribe an HMGCoA reductase inhibitor (Zocor). What changes can be expected in her lipid profile as a result of taking this medication?**

Zocor is a statin which works to lower cholesterol by decreasing the rate of production of LDL. It can be expected that her LDL levels will drop, as well as potentially seeing an increase in HDL levels and a decrease in triglyceride levels. (5)

**14. From the information gathered within the clinical domain, list possible nutrition problems using the diagnostic term.**

Biochemical: Food-medication interaction (diuretics affected by high sodium in diet)

Weight: Overweight adult

**E. Behavioral–Environmental Domain**

**15. What are some possible barriers to compliance? Within this domain, list possible nutrition problems.**

Mrs. Anderson tried cutting back on salt but then stopped because she felt that food does not taste good without it. She also is not physically active enough and often skips her walks to play BINGO. Possible nutrition problems within the domain are Knowledge and Beliefs: Limited Adherence to nutrition related recommendations and undesirable food choices as well as Physical Activity and Function: Physical inactivity.

**IV. Nutrition Diagnosis**

**16. Select two KEY nutrition problems and complete the PES statement for each.**

PES #1 Overweight related to not ready for diet/lifestyle change as evidenced by a BMI of 25.8, unwillingness to apply nutrition related recommendations, and reports of intake of energy in excess of estimated energy needs (intake of 3866 kcal when needs are only 1745 kcal)

PES #2 Undesirable food choices related to unwillingness to apply nutrition information as evidenced by poor lipid panel (Apo A of 75, Apo B of 140, Apo B of 150) and estimated intake inconsistent with nutrition prescription (intake of 3866 kcal, 5504 mg sodium)

**V. Nutrition Intervention**

**17. When you ask Mrs. Anderson how much weight she would like to lose, she tells you she would like to weigh 125, which is what she weighed most of her adult life. Is this reasonable? What would you suggest as a goal for weight loss for Mrs. Anderson?**

This is a reasonable weight loss for Mrs. Anderson. This would result in a weight loss of 35 pounds and her BMI would be 20.3 at 125 pounds, which is in a healthy range. I would suggest a goal of losing 1 to 2 pounds per week.

**18. How quickly should Mrs. Anderson lose this weight?**

Mrs. Anderson should lose the weight at a rate of 1-2 pounds per week. She should work on this weight loss over a six month period. This is a healthy and realistic rate of weight loss.

**19. Write Nutrition Prescription for patient. Include Diet type, kcal level, % kcal from CHO, PRO, FAT, Saturated fat, cholesterol, Na.**

TLC/DASH diet, 1745 kcal, saturated fat to be less than 7% of total calories (less from trans fat), total fat 25-35% of total calories, carbohydrate 50-60% of total calories (emphasis on complex carbs), protein approximately 15% of total calories, less than 200mg/day of cholesterol, less than 2300mg sodium/day

**20. For each of the PES statements that you have written, establish an ideal goal (based on the signs and symptoms) and an appropriate intervention (based on the etiology). Use IDNT manual to label Intervention domains and subclasses; and give details of exactly what you are going to do.**

PES #1 Nutrition Counseling: Strategy: Goal Setting

- o Goal: Lose weight at a rate of 1-2 pounds per week until goal weight of 125 pounds
- o Intervention: Monitor weights weekly, offer advice on proper foods to be eating

PES #2 Nutrition Counseling: Strategy:

- o Goal: Get lab values back to normal ranges
- o Intervention: take lab values monthly to monitor progress

## **VI. Nutrition Monitoring and Evaluation**

**21. Evaluate Mrs. Anderson's labs at 3 months and then at 6 months. Have the biochemical goals been met with the current regimen?**

Her glucose levels have remained normal at both 3 and 6 months. Her BUN had fallen into a normal range after 3 months, but then increased to higher than ever after 6 months. Her cholesterol has decreased after each blood test which shows improvement, however more improvement is needed to bring the levels down to normal. Her HDL is slowly rising but needs to increase more to be at a healthy level. Her LDL is steadily decreasing, but still needs to decrease more after 6 months to be in a normal range. Her Apo A rose to almost normal after 3 months to normal after 6 months. Her Apo B became normal after 3 months and continued to stay in a normal range after 6 months. Her triglycerides also fell into a normal range after 3 months and continued to remain normal after 6 months. Overall, not all goals have been met, however she is showing improvements in all areas except glucose and BUN.

**22. Write a concise ADIME note by pulling the key components from you answers. Consider the admission data only (not the 3 and 6 month data). Hand in a double spaced typed version only.**

Nutrition Assessment

11/25/13

1100

A: African American female, 54 y/o. 160#, 66 in tall, BMI 25.8, IBW 130#, housewife, diagnosed with stage 2 HTN, history of smoking, walks 30 mins 4-5 times per week most weeks, no c/o symptoms related to HTN, rule out metabolic syndrome, has maintained 10# weight loss over the past year, takes hydrochlorothiazide 25 mg daily, multivitamin daily, has not followed recommended 4-g Na diet, often eats out on weekends at pizza place or steakhouse and has 2 beers, skips dinner on BINGO nights and has ice cream and snacks all night, physical exam reveals stage 1 HTN, hypertensive heart disease, and early COPD, HR 80 bpm, BP 160/100 mm, family history of death due to uncontrolled HTN

Lab values BUN 20 mg/dl, chol 270 mg/dl, HDL 30 mg/dl, LDL 210 mg/dl, Apo A 75 mg/dl, Apo B 140 mg/dl, TG 150 mg/dl

D: Overweight related to not ready for diet/lifestyle change as evidenced by a BMI of 25.8, unwillingness to apply nutrition related recommendations, and reports of intake of energy in excess of estimated energy needs (intake of 3866 kcal when needs are only 1745 kcal)

Undesirable food choices related to unwillingness to apply nutrition information as evidenced by poor lipid panel (Apo A of 75, Apo B of 140, Apo B of 150) and estimated intake inconsistent with nutrition prescription (intake of 3866 kcal, 5504 mg sodium)

I: Nutrition Prescription: Low sodium, TLC/DASH diet, 1745 kcal, saturated fat to be less than 7% of total calories (less from trans fat), total fat 25-35% of total calories, carbohydrate 50-60% of total calories (emphasis on complex CHO), protein approximately 15% of total calories, less than 200mg/day of cholesterol, less than 2300mg sodium/day

Nutrition Counseling: Strategy: Goal Setting

Set realistic goals for weight loss.

Goal: Lose weight at a rate of 1-2 pounds per week until goal weight of 125 pounds

Intervention: Monitor weights weekly, offer advice on how much and what to be eating and ways to do this

Nutrition Counseling: Strategy: Stimulus control

Advise to stay away from high salt foods and those that cause patient to overeat

Goal: Get lab values back to normal ranges

Intervention: take lab values monthly to monitor progress

M/E: Food/Nutrition related history: Energy Intake: Total Energy Intake

Outcome: Have a total energy intake of about 1745 kcal per day

Food/Nutrition Related History: Food Intake: Types of Foods

Outcome: avoidance of high salt foods and adding salt to meals

Knowledge/Beliefs/Attitudes: Beliefs and Attitudes: Food Preferences

Outcome: Learn that high fat and high salt foods are going to kill her if she keeps up her current way of living

Physical Activity and Function: Physical Activity: duration

Outcome: Increase physical activity to 90 minutes a day to promote weight loss.

Christina Valenti, Dietetic Student

## References

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